5-1976

Manual for the optometric examination of the hearing impaired

Lawrence D. Harrison
Pacific University

Recommended Citation
https://commons.pacificu.edu/opt/431

This Thesis is brought to you for free and open access by the Theses, Dissertations and Capstone Projects at CommonKnowledge. It has been accepted for inclusion in College of Optometry by an authorized administrator of CommonKnowledge. For more information, please contact CommonKnowledge@pacificu.edu.
Manual for the optometric examination of the hearing impaired

Abstract
Manual for the optometric examination of the hearing impaired

Degree Type
Thesis

Degree Name
Master of Science in Vision Science

Committee Chair
Niles Roth

Subject Categories
Optometry

This thesis is available at CommonKnowledge: https://commons.pacificu.edu/opt/431
MANUAL FOR THE OPTOMETRIC EXAMINATION
OF THE HEARING IMPAIRED

Submitted in Partial Fulfillment of Requirements
for the Doctor of Optometry Degree

Pacific University College of Optometry
May 1976

Niles Roth, Advisor
MANUAL FOR THE OPTOMETRIC EXAMINATION
OF THE HEARING IMPAIRED

Lawrence D. Harrison
<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory Remarks on the Hearing Impaired Individual</td>
<td>1</td>
</tr>
<tr>
<td>Bibliography</td>
<td>9</td>
</tr>
<tr>
<td>Organizations &amp; Publications</td>
<td>11</td>
</tr>
<tr>
<td>Text of Manual</td>
<td></td>
</tr>
<tr>
<td>Case History</td>
<td>12</td>
</tr>
<tr>
<td>Visual Acuity (Letters)</td>
<td>14</td>
</tr>
<tr>
<td>Visual Acuity (E Chart)</td>
<td>15</td>
</tr>
<tr>
<td>Donder's Amplitude of Accomodation</td>
<td>16</td>
</tr>
<tr>
<td>Rotations and Pursuits</td>
<td>17</td>
</tr>
<tr>
<td>NPC</td>
<td>18</td>
</tr>
<tr>
<td>Saccades</td>
<td>19</td>
</tr>
<tr>
<td>Fixations</td>
<td>20</td>
</tr>
<tr>
<td>Cover Test (Far)</td>
<td>21</td>
</tr>
<tr>
<td>Cover Test (Near)</td>
<td>22</td>
</tr>
<tr>
<td>PD</td>
<td>23</td>
</tr>
<tr>
<td>Ophthalmoscopy</td>
<td>24</td>
</tr>
<tr>
<td>Keratometry</td>
<td>25</td>
</tr>
<tr>
<td>Phoria (Vertical and Lateral)</td>
<td>26</td>
</tr>
<tr>
<td>Retinoscopy (Static)</td>
<td>27</td>
</tr>
<tr>
<td>Retinoscopy (Dynamic)</td>
<td>28</td>
</tr>
<tr>
<td>Content of Manual</td>
<td>page</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Preparation for Clock Dial (20/40 Clur)</td>
<td>29</td>
</tr>
<tr>
<td>Clock Dial (Axis)</td>
<td>30</td>
</tr>
<tr>
<td>Cylinder Power Determination with Rotating &quot;T&quot; Chart</td>
<td>32</td>
</tr>
<tr>
<td>Cylinder Power Determination with Fan Dial Chart</td>
<td>34</td>
</tr>
<tr>
<td>Dichrome Test</td>
<td>35</td>
</tr>
<tr>
<td>JCC</td>
<td>36</td>
</tr>
<tr>
<td>Equalization</td>
<td>37</td>
</tr>
<tr>
<td>Phorometry</td>
<td>38</td>
</tr>
<tr>
<td>Minimum Plus 20/20</td>
<td>39</td>
</tr>
<tr>
<td>Near Cross Cylinder</td>
<td>40</td>
</tr>
<tr>
<td>OEP #19 (Amp. of Acc. @ 13&quot;)</td>
<td>41</td>
</tr>
<tr>
<td>OEP #20, #21, #21 monocular</td>
<td>42</td>
</tr>
<tr>
<td>Biomicroscopy</td>
<td>43</td>
</tr>
<tr>
<td>Tonometry</td>
<td>44</td>
</tr>
<tr>
<td>Tonometry with McKay Marg</td>
<td>45</td>
</tr>
<tr>
<td>Tonometry with Non-Contact</td>
<td>46</td>
</tr>
<tr>
<td>Color Vision</td>
<td>47</td>
</tr>
<tr>
<td>Stereo Fly</td>
<td>48</td>
</tr>
</tbody>
</table>
Would you repeat that please? And you realize not too soon into the examination that you are dealing with a patient who is hard of hearing. More than any other health care professional, the Optometrist requires subjective patient interpretation if optimum test results are to be achieved. This need to develop sufficient communication is, in itself, a micro-educational experience for the patient. Instructions must be understood and executed and, in most cases, conveyed back to the examiner. Usually, communication with the patient as to the tasks required of him/her is a relatively simple operation. In most persons the auditory system serves as the most efficient means to convey to the patient what needs to be accomplished within the examination. However, not all persons utilize this capacity.

Perhaps due to either aging factors or to a congenital situation, the most efficient means to convey information often is not through the auditory modality, but visually. These persons must then place a higher than average demand on their visual mechanism. As a result, Optometric analysis must be nothing less than complete. Unfortunately, as a rule, the care received may be inadequate. This is I believe a direct result of the fact that Optometric testing is designed to be delivered only through the auditory faculty. Because of this, if subjective patient responses are to be utilized, extra time must be taken from the routine of the examination to have the Optometrist and patient both communicate with a writing pad. Often to "make up" for the extra time spent, portions of the exam are deleted. Or perhaps the patient is rescheduled for further testing. In either situation, the patient receives inadequate visual care or the Optometrist spends a great deal of extra time. I do not fully know which situation is more prevalent, though I wish the latter.

It is my contention here to provide a means whereby time to communicate patient instructions visually will more nearly equal the time to communicate auditorily.

The individuality of the person who does not have the normal hearing pattern is, of course, an infinite variable: "Each person is a unique individual, and innumerable variations in the type, degree and range of hearing loss interact with the individual personality to produce one individual person." However, I feel that the lack of provision in our society for the hard-of-hearing creates psychological problems in these individuals. Acceptance is a common want: In a study by John Tringo, a University of Kentucky psychologist, 455 students and rehabilitation workers were asked to rank disabilities from most accepted to least. In general, the more concealed or hidden the disability, the more "accepted" it was. In addition, blindness was ranked more accepted than deafness in this study. The main issue I am eluding to here is the obvious uplift to the hard-of-hearing person when the practitioner is prepared to examine through visual instructions and does not have to resort to a situation which may appear unusual or out of the ordinary. Having a prepared manual, as here or as created by yourself, is evidence to the patient that their situation is common. Their personal image may increase.
"Our sense of identity depends on the integrity of a cycle of perception, recognition, desire, and action."

"Seven States of Consciousness" by Anthony Campbell
Deafness is usually not an all or nothing phenomenon. Deafness refers to a functional hearing loss of sufficient severity to prevent aural comprehension of speech even with hearing aids. All too often it is assumed that a deaf individual has zero auditory skills: "Deafness implies a total inability to hear which is seldom the situation."[3] There are two general characteristics of the hearing impaired population: 1) congenital and early acquired deafness, where language skills may be low or absent; and 2) partial hearing or hard-of-hearing, which has usually resulted from the process of aging or as pathologic consequence. Depending on the nature of the individual patient, examination with written communication may provide varying information. However, in cases where auditory input is not efficient, the visual or written mode exists as the only present alternative.

Not only do the hearing impaired individuals have increased demand on their visual system, but a study at the University of California School for the Deaf indicates that "the deaf have more vision defects than hearing students, especially in the category of refractive error."[4] Hearing loss has been with mankind apparently since the beginning of time. Industrial society has increased noise levels and medical science has kept people alive longer. As a consequence, the proportion of individuals with relatively sub-standard hearing capacity is an increasing percentage. The Bureau of Education cites the figure 0.075 (3 in 4000 persons) as the incidence of school age children in the U.S. who are deaf (97 dB ISO hearing loss in better ear) and 0.5 as the figure who are hard-of-hearing (1 in 200).[6] Optometry, as the primary vision care provider, must accommodate the testing procedure to incorporate these individuals. This is even of greater importance considering their high demand on visual input as "any condition in the life of a deaf child (or hard-of-hearing) that adds to the restrictions already imposed by deafness increases the obstacles to personal development."[7] Within the confines of a model, it can be viewed that as auditory sensual information is relied on less, then the visual processing system must extract from the environment ever-increasing data: "Visual disability impairs the major compensatory sense of the deaf (of hard-of-hearing)."[8] The potential of individuals with even severe hearing impairment is demonstrated by their ability to obtain a drivers license. This is evidence that the visual system can be utilized to supply, at least in part, information that the auditory system had once supplied: "The facts show that deaf drivers have a better record than others. The small disadvantage of not hearing is apparently more than compensated for by greater visual vigilance."[9]

If an individual is incapable of comprehending auditory signals and does not possess the ability to recognize and understand written language, then optometric testing can only include analysis of specific tests, much like the examination of a very young child. If the patient is skilled at sign language, a translator can be of valuable assistance. In addition a few deaf individuals are highly skilled lipreaders. And here lies another alternate form for communication.[9]
In cases where language skills are low or absent, the inability to hear is most often the result of the individual being born with the condition or it occurred in the early years of life before substantial language skills had been developed: "Early profound deafness or prelingual deafness are reasonable terms to describe the bulk of today's population in schools for the deaf and in the (total) deaf community at large." The aim of most all deaf education is the teaching of language which includes speech and speech reading. The fact that a very small percentage (1%) of deaf persons have adequately mastered the language well enough to read books often gives the apparent evidence that these individuals are not only deaf, but dumb. The primary reason for their inability to read at standard levels is due directly to their hearing impairment "because deafness retards the development of verbal language, it slows the pace of all learning based on verbal language comprehension. The average congenitally deaf pupil is about 4 years behind the hearing pupil in scholastic attainment.

If the total deaf individual is to learn a spoken language, then this individual must depend largely on the visual sense organ to develop conceptual language patterns. It is the Optometrist's responsibility to assess the visual system of this individual as best as possible and direct the patient, if desired, to organizations which may benefit the person.

The Optometrist, then, is confronted with a dilemma in the examination of an individual who cannot comprehend auditory input nor visual input. Here, as previously stated, the patient must be examined with the benefit of complete examination. The use of the VER technique would prove invaluable in such situations.

For the hard-of-hearing child or adult who has some degree of language comprehension, this manual will provide the most benefit. To gain a closer appreciation of the problems encountered by the totally deaf individual, perhaps you would care to momentarily place yourself in a similar situation. Imagine watching the screen of a foreign television station with the sound off! Your problem now is not merely to read lips, even if you could, but you would be faced with the overwhelming task of comprehending the language. Depending on the degree, persons with hearing impairments must confront this type of problem everyday. Imagine another very now. It is well known that the typical individual who develops blindness is usually in the adult years. Here, the Optometrist has an excellent comprehension of the obstacles this world poses to someone who goes blind and must learn to get around. When this individual, for instance, is confronted with the noise of an oncoming auto, this blind person can usually locate the direction of the noise and further associate that particular noise with that of an automobile. Thus, this individual has the conception of what the noise represents. The person here has utilized the past associations between hearing and sight. Such a person is thereby supplied with a framework for interpreting the world in a "visual" sense through the use of auditory sensations. The typical
deaf person, however, and a large portions of the severely impaired individuals, were born with their substandard capability. As a consequence, these persons have never utilized their auditory system long enough to have developed the abilities that require the interactions between hearing and sight, such as reading and speech. As a result, progress in these performance areas (of speech and reading) are gradual without the support of the auditory feedback modality.

The examiner will find it valuable to directly face the patient while speaking whenever possible. Though only a few individuals can comprehend totally through lipreading, when auditory input is reduced the additional cues from the Optometrist's lips can prove an effective aid. The forthcoming manual is by no means meant to be a rigid format. The Optometrist must modify the proposed technique to his/her own specific situation. In addition, the text of this manual should not be the only communication between patient and Optometrist. The Optometrist will inevitably find it beneficial to keep a pad a pencil near both the patient and himself for additional communications.

With proper examination technique, the Optometrist can fulfill the basic needs of the examination and the patient's visual system can be guided to a highly efficient level to help offset the auditory deficit. A deficit that must be remembered to be only relative. As, if the whole of society were deaf, civilization would have inevitably developed alternate effective means of communication on a widespread level. The problem with the individual who has a hearing impairment is not so much a problem of not reacting to vibrations of the air, but the obstacles that must be overcome in order to exist in a life where hearing is the rule and deafness the exception.
"What we usually take to be the whole of life is in reality merely the outermost layer; it is like a thin film of oil floating on water."

"Seven States of Consciousness" by Anthony Campbell
ADDITIONAL IDEAS

Much information can be obtained before the Optometrist begins the routine examination. If the patient is able to negotiate around objects in the office adequately without bumping into them, it can be ascertained that acuity, at least in one eye, is great enough to accomplish this. However, the converse is not true. The fact that the patient bumps objects does not, on the other hand, indicate severe loss of acuity. As "not infrequently, the balance mechanism of deaf persons is impaired."^{15}

If the patient is a child, observation of play may supply worthwhile information as to the normal working distances, possible head tilt, and other signs of visual distress.^{16}

For obtaining the case history, the benefit of a written questionaire is obvious. A sample of such a case history is provided in the text here. The patient alone may complete this form or perhaps with help from guardian or translator. In any event, this written questionaire will allow the practioneer to more quickly determine the nature of the patient's chief complaint. Communication into the specifics of the complaint, of course, must be further continued.
If visual acuity is to be adequately assessed, the patient must either be able to respond to the projected letters or "E" symbols by either oral or written means. If such a condition does not exist, then it becomes necessary to instruct the patient in the use of the tumbling "E" chart. An enlarged hand-held "E" on a handle, often used for screening purposes, is most useful (one is provided here).

If after a reasonable attempt to instruct the patient in its use, the concept is not grasped, then it may be best to have the patient practice under the supervision of another person at home until the concept is developed. The patient would then return a short time later to continue with the examination.

If the use of the phoropter proves inefficient, a trial frame may be the best method to determine retinoscopy along with the use of a distant movie cartoon.
1. Deafness and Learning: A Psychological Approach
   Hans G. Furth
   Van Wart Publishing Company, Inc. pp. 11

2. Psychology Today Magazine
   November 1975

3. The Conquest of Deafness
   Ruth E. Bender PhD
   The Press of Case Western Reserve University
   Cleveland & London 1970 pp 11

4. Vision Characteristics of Deaf Students
   Gerald Polland, Richard Neumeyer
   Am Journal of Optometry & Physiology
   Vol. 51, No. 1974 pp 839

5. Deafness & Learning: A Psychological Approach
   pp 4

6. The Hearing Impaired Child in a Regular Classroom
   Winifred H. Northcott, PhD Editor
   The Alexander Graham Bell Assoc. for the Deaf, Inc. 1973 p 2

7. The Psychology of Deafness
   Edna Simon Levine
   Columbia University Press

8. The Psychology of Deafness
   pp 148

9. Deafness and Learning: A Psychological Approach
   pp 4

10. Eh? Refracting the Deaf
    John Cole
    The Optician July 12, 1974 p 12,16

11. Deafness and Learning: A Psychological Approach
    pp 7

12. etal.
    pp 3
13. Psychology of Deafness  
   pp 148

14. Deafness and Learning: A Psychological Approach  
   pp 7

15. Psychology of Deafness  
   pp 152

16. Optometry and A Deaf Child  
   Eleanor A. Rieck, O.D.  
   J of Amer Optometry Assoc.  
   Vol. 46, Number 6 Jun 1975 pp 649

17. Optometry and A Deaf Child  
   pp 649

---

BIBLIOGRAPHY FOR TEXT

1. Roth, Miles, O.D., Ph.D.  
   Projected Optometric Instructions for the Deaf, Personal Communication

2. Weber, Jack, O.D.  
   How to Elicit Reliable Responses in the Subjective Examination of Poor Observers  
ORGANIZATIONS & PUBLICATIONS

1. The Deaf American
   314 Thayer Avenue
   Silver Spring, Maryland 20910
   (Publication of the National Association of the Deaf)

   5034 Wisconsin Avenue N.W.
   Washington DC 20016
   (Publication of the Convention of American
   Instructors of the Deaf)

For Information (Especially for Parents):

3. Mrs. Lee Katz, President CAID
   11210 Healy Street
   Silver Spring, Maryland 20902

4. The Volta Review
   1537 35th Street N.W.
   Washington DC 20007
   (Publication of Alexander Graham Bell Assoc. For Deaf)
Rotating the inner disc places pairs of letters behind the red and green windows that can be either of equal clarity or blurred on the red side or on the green side.
PHOTOCOPY OF DUCTION (VERGENCE) TEST DEMONSTRATOR
THE TWO TRANSPARENCIES ARE MOVEABLE RELATIVE TO EACH OTHER
TO ILLUSTRATE THE CHANGE FROM CLEAR SINGleness TO SLIGHTLY
BLURRED SINGleness, AND FINALLY DOUBLING
PHOTOCOPY OF CROSS CYLINDER DEMONSTRATOR
NAME ________________________

ADDRESS ________________________ CITY ________________________

PHONE __________ DATE OF BIRTH ________________________

REASON(S) FOR EXAMINATION TODAY:

CHECK UP
DISTANCE VISION BLURRY
NEAR VISION BLURRY
HEADACHES

PAIN IN OR AROUND EYES
EYE "WANDERS"
EYES TIRE EASILY
OTHER, PLEASE EXPLAIN ________________________

HAVE YOU EVER NOTICED:

DOUBLING OF OBJECTS
HALOS AROUND LIGHTS
PAIN ON MOVING EYES
DIZZINESS
SPOTS BEFORE EYES

"SPARKS" OF LIGHT
SENSITIVITY TO LIGHTS
EYELIDS STICK TOGETHER IN MORNING
EYES STING, BURN, OR ITCH

YOUR GENERAL HEALTH MAY AFFECT YOUR EYES.

TO YOUR KNOWLEDGE, DO YOU PRESENTLY HAVE:

HIGH BLOOD PRESSURE
DIABETES
GLACOMA

HEART TROUBLE
ANY OTHER HEALTH PROBLEM PLEASE DESCRIBE ________________

DATE OF LAST VISUAL EXAMINATION __________ 19 __________

DO YOU NOW WEAR PRESCRIPTION GLASSES? __________

IF NO, HAVE PRESCRIPTION GLASSES EVER BEEN PRESCRIBED FOR YOU? __________
DATE OF LAST DENTAL EXAMINATION ______________________ 19__
DATE OF LAST PHYSICAL EXAMINATION ______________________ 19__
MEDICATIONS OFTEN AFFECT YOUR EYES.
ARE YOU PRESENTLY TAKING ANY MEDICATIONS? ______
IF SO, NAME OF MEDICATION IS-_______________________
HAVE YOU EVER HAD EYE SURGERY? ______________________
REASON FOR SURGERY WAS _________________________
HAVE YOU EVER HAD AN EYE DISEASE? ______________________
ARE YOU ALLERGIC TO ANY MEDICATION OR SUBSTANCE? _____
IF SO, THE NAME(s) ARE _________________________
PLEASE COMMENT AS NEEDED ON ANY VISUAL PROBLEMS YOU
MAY BE HAVING; _________________________
_____________________
_____________________
_____________________
_____________________
DATE _______19__
_____________________
SIGNATURE
TRY TO READ ALL THE LETTERS SHOWN.
IF YOU ARE NOT SURE ABOUT ANY LETTER,
QUEUE WHAT YOU THINK IT MIGHT BE.
PLACE THE SHAPE I JUST PUT IN YOUR HAND SO THAT IT LOOKS JUST LIKE THE ONE SHOWN.
LOOK AT THE LETTERS I AM POINTING TO.
I WILL MOVE THEM CLOSER TO YOU SLOWLY,
RAISE YOUR HAND WHEN THE LETTERS ARE
TOO BLURRY TO READ.
LOOK AT THE LIGHT IN MY HAND.
FOLLOW IT JUST WITH YOUR EYES.
REMEMBER, DON'T MOVE YOUR HEAD.
TELL ME IF THERE IS ANY PAIN.
NOW, LOOK AT THE LETTER I AM POINTING TO IN MY HAND. I AM GOING TO MOVE IT SLOWLY TOWARDS YOU. SAY THE WORD "TWO" OR RAISE YOUR HAND IF YOU EVER SEE TWO LETTERS.
LOOK AT WHAT I AM HOLDING IN EACH HAND.
I WANT YOU TO LOOK AT THE OBJECT THAT I WIGGLE JUST WITH YOUR EYES.
PLEASE KEEP YOUR HEAD VERY STILL.
LOOK AT THE LETTERS I AM POINTING TO ACROSS THE ROOM.
NOW LOOK AT THE LETTER I AM POINTING TO UP CLOSE.
LOOK ONLY ACROSS THE ROOM AT THE LETTERS IF I TOUCH YOU ONCE, LOOK ONLY AT THE LETTER UP CLOSE IF I TOUCH YOU TWICE.
NOW, LOOK JUST AT THE LETTER ACROSS THE ROOM. I WILL BE LOOKING AT YOUR EYES AS YOU LOOK AT THE LETTER.
REMEMBER, LOOK JUST AT THE LETTER.
NOW, LOOK AT THE LETTER I AM HOLDING.
I WILL AGAIN BE LOOKING AT YOUR EYES.
DON'T FORGET, LOOK JUST AT WHAT I AM HOLDING.
PLEASE LOOK AT MY EYE ABOVE WHERE I PLACE MY FINGER.
NEXT, I WILL BE LOOKING AT YOUR EYE TO MAKE SURE IT IS HEALTHY.
I NEED TO GET UP CLOSE TO SEE EVERYTHING WELL.

PLEASE LOOK ACROSS THE ROOM WHERE I WILL POINT.
TRY TO KEEP YOUR EYES FROM NOT MOVING.

DON'T WORRY IF MY HEAD SOMETIMES IS IN YOUR WAY.
YOU WILL NEXT BE IN AN INSTRUMENT THAT MEASURES THE SHAPE OF YOUR EYE. NOTHING WILL TOUCH YOUR EYE. PLEASE LOOK DOWN THE TUBE STRAIGHT AHEAD AND MAYBE SEE YOUR OWN EYE.
FOR THE NEXT PART, I NEED YOU TO LINE UP TWO LINES OF LETTERS. I WILL SHOW YOU JUST WHAT WE NEED TO DO.

LOOK AT WHAT I AM HOLDING. WHEN THE LETTERS ARE LINED UP JUST RIGHT I WILL PUT MY FINGER ON TOP.

WHEN YOU SEE THIS AGAIN, RAISE YOUR HAND UP.

REMEMBER, WHEN THE LETTERS ARE LINED UP JUST RIGHT RAISE YOUR HAND HIGH.
DON'T WORRY ABOUT ANSWERING ANY QUESTIONS HERE. LOOK ACROSS THE ROOM AT THE RED AND GREEN LIGHT. IF YOU CAN SEE ANY LETTERS, TRY TO READ THEM. IT IS IMPORTANT THAT YOU DO NOT LOOK UP CLOSE. LOOK ONLY AT THE RED AND GREEN LIGHT PLEASE.

IMPORTANT -- PUT YOUR HAND UP HIGH IF BOTH THE RED AND GREEN LIGHT DISAPPEARS.
GOOD. NOW I NEED YOU TO LOOK UP CLOSE AT THE CARD AROUND MY LIGHT. LOOK ONLY AT THE CARD AND TRY TO READ ANY LETTERS OR NUMBERS YOU SEE OUT LOUD.
RAISE YOUR HAND WHEN YOU CAN JUST BARELY SEE THE LETTERS ACROSS THE ROOM.  GO AHEAD AND CALL ANY LETTERS OUTLOUD TO ME.
NOW, LOOK AT WHAT I AM HOLDING IN MY HAND. THERE ARE LINES SHAPED LIKE A WHEEL OR CLOCK. CAN YOU SEE WHICH LINE LOOKS DARKER AND CLEARER? PLEASE POINT TO IT NOW.

THIS NEXT PART WILL BE VERY SIMILAR TO THIS. I NEED YOU TO TELL ME IF ANY OF THE LINES ACROSS THE ROOM LOOK DARKER OR CLEARER.

THERE MAY BE NO LINES DARKER. BUT IF THERE IS, IT CAN BE ANYWHERE IN THE WHEEL.

IMPORTANT -- REMEMBER WHERE THE DARKER OR CLEARER LINE IS SO YOU CAN POINT TO IT ON THIS SMALLER WHEEL LATER.

RAISE YOUR HAND UP HIGH IF THERE IS A DARKER LINE.

READY?
NOW, POINT TO THE LINE THAT LOOKED DARKER OR CLEARER TO YOU.
LOOK AT THE TWO TYPES OF LINES ON THE CHART ACROSS
THE ROOM. I WILL POINT TO THEM.

DOES ONE SET LOOK DARKER OR CLEARER?
RAISE YOUR HAND HIGH WHEN I POINT TO THEM.
LOOK CAREFULLY NOW AND SEE IF ANYTHING CHANGES.

WHAT LINES LOOK CLEARER OR DARKER NOW? RAISE YOUR HAND HIGH WHEN I POINT TO THEM.

WE MAY DO THIS A FEW TIMES, SO LOOK CLOSELY.
GOOD. NOW LOOK AT THE TWO LINES I AM POINTING TO.
PAY NO ATTENTION TO ANY OTHER LINES YOU SEE.
LOOK CAREFULLY AND SEE IF ANYTHING CHANGES.
WHAT LINE LOOKS DARKER AND CLEARER NOW?
RAISE YOUR HAND UP WHEN I POINT TO IT.
WE MAY DO THIS A FEW TIMES SO LOOK CLOSELY.
REMEMBER -- LOOK ONLY AT THE TWO LINES I POINT TO.

READY?
LOOK AT WHAT I AM HOLDING IN MY HAND.
ARE THE LETTERS BLACKER OR DARKER ON THE RED COLOR SIDE OR ARE THEY BLACKER OR DARKER ON THE GREEN COLOR SIDE? SAY "RED" OR "GREEN". SAY "EQUAL" IF THE LETTERS LOOK EQUALLY DARK.

NEXT, WE WILL DO THIS SAME THING ACROSS THE ROOM. SO, SAY "RED" OR "GREEN" OUTLOUD.

I MAY CHANGE THINGS: SO IF I TAP YOU ON THE SHOULDER LOOK CLOSELY AT THE LETTERS AND ANSWER AGAIN.
I will show you two lines one at a time.
I need you to tell me which view is easier to read.
I will tap your hand one time when I show you the first view. And I will tap your hand two times when I show you the second view.

Will you please:
- tap my hand one time if the first view looked better to you.
- tap my hand two times if the second view looked better to you.
ON THE NEXT TEST YOU WILL SEE TWO LINES AT THE SAME TIME. TAP MY HAND ONE TIME IF THE TOP LINE IS EASIER TO READ. TAP MY HAND TWO TIMES IF THE BOTTOM IS EASIER TO READ. IF I TOUCH YOUR SHOULDER, GET READY TO DO THIS AGAIN.

READY?
LOOK AT WHAT I AM HOLDING. LATER ON YOU WILL SEE A LINE OF LETTERS LIKE WHAT IS IN MY HAND.

WATCH NOW as I MAKE THE LETTERS BLUR SLIGHTLY. WHEN I STOP COME BACK AND READ MORE.

NEXT, I WILL MAKE THE ONE LINE TURN INTO TWO LINES. LOOK UP NOW AND WATCH AS I DO THIS.

AND FINALLY, I WILL MAKE THE TWO LINES GO BACK INTO ONE. LOOK UP NOW AND WATCH THIS.

GOOD. NOW I NEED YOU TO WATCH FOR THESE SAME THINGS. SAY "BLUR" IF THE LETTERS BLUR. SAY "TWO" IF TWO LINES APPEAR. SAY "ONE" WHEN THE TWO LINES BECOME ONE.

O.K.? BLUR, TWO, ONE.
READ ALOUD THE LETTERS AS SOON AS YOU CAN.
NOW LOOK AT WHAT I AM HOLDING. WHICH SET OF LINES LOOK DARKER OR BLACKER?
MOVE YOUR HAND IN THE SAME DIRECTION AS THESE DARK LINES.

NEXT, WE WILL DO JUST THAT.
SHOW ME WITH YOUR HAND WHICH LINES LOOK DARKER WHEN YOU FIRST SEE THEM.
GET READY AGAIN IF I TAP YOU ON THE SHOULDER.
LOOK AT THE LINES I AM POINTING TO. I WILL BE MEASURING HOW MUCH YOUR EYE CAN CHANGE FOCUS. WHEN I TAP YOU ON THE SHOULDER: START READING THESE LINES OUTLOUD. STOP READING WHEN THE LETTERS DO NOT GET CLEARER AND STAY BLURRY.
NOW, LOOK AT THE LETTERS I POINT TO. I WILL BE CHANGING THE LENSES IN FRONT OF YOUR EYE.

RAISE YOUR HAND UP WHEN YOU CANNOT SEE EVEN ONE LETTER. KEEP LOOKING CLOSELY NOW.
THIS INSTRUMENT IS A MICROSCOPE. AGAIN, I WILL LOOK AT YOUR EYE TO MAKE SURE EVERYTHING IS HEALTHY.

JUST **LOOK STRAIGHT AHEAD** AT THE WALL BEHIND ME.
THIS NEXT INSTRUMENT WILL MEASURE THE PRESSURE INSIDE YOUR EYE. PRESSURE IN YOUR EYE IS VERY IMPORTANT TO MAKE SURE YOUR EYE STAYS HEALTHY.
I WILL RAISE YOUR HAND UP. KEEP IT UP IN THE AIR AND LOOK AT YOUR THUMB. I WILL LIGHTLY TOUCH THE INSTRUMENT TO YOUR EYE.

IMPORTANT -- REMEMBER TO KEEP LOOKING AT YOUR THUMB.
A puff of air will measure the pressure in your eye. Put your hand where I place it and I will show you.

It is important that you look at the red light when you are in the instrument.
I WILL SHOW YOU A PICTURE WITH A HIDDEN NUMBER OR HIDDEN LETTER. IF YOU CAN FIND THE LETTER OR NUMBER, SAY IT OUTLOUD OR TRACE IT WITH THE BRUSH I MAY GIVE YOU.
I WILL BE PLACING SOME SPECIAL GLASSES ON YOU SOON. WHEN YOU LOOK THROUGH THESE, I WANT YOU TO GENTLY PINCH THE WINGS YOU SEE.

WE WILL DO THIS NOW.

--------------------------

NOW, PLACE THE BRUSH I GIVE YOU ON THE CIRCLE THAT LOOKS DIFFERENT FROM THE REST IN THE BOX I POINT TO. READY?
YOU HAVE DONE VERY WELL. CONGRATULATIONS!!
Though this manual has not as yet been utilized in its entirety, the individual portions, with their various demonstration modes, have been tested on various individuals.

For developing some areas of the text, this author's clinical experience served as foundation.

It is hoped that this manual will serve the practioneer and patient in enhancing their communication exchange.